Aug. 20, 1957 M. E. WILLIAMS ET AL 2,803,481

ALTERNATE-HAND DEADLOCKING MECHANISM

Filed March 28, 1955

Fig. 1.

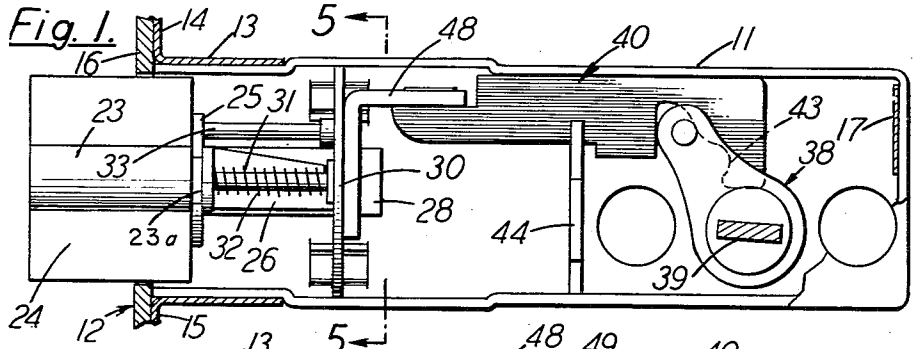


Fig. 2.

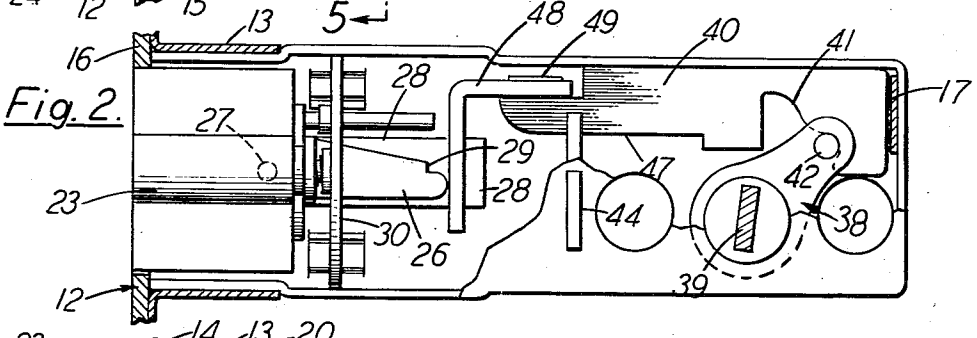


Fig. 3.

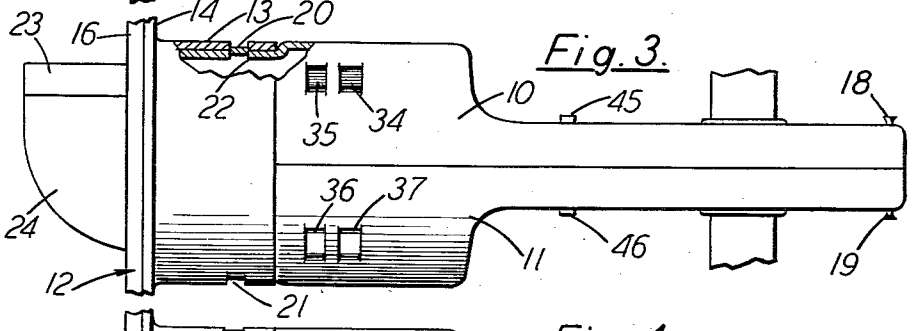


Fig. 4.

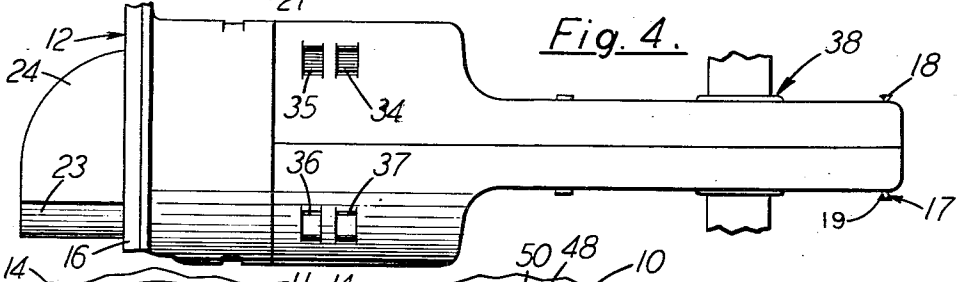


Fig. 5.

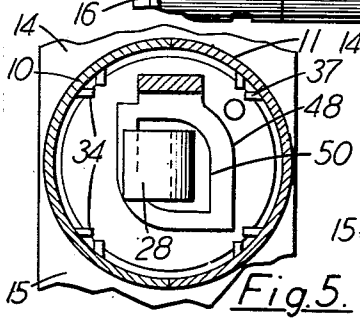
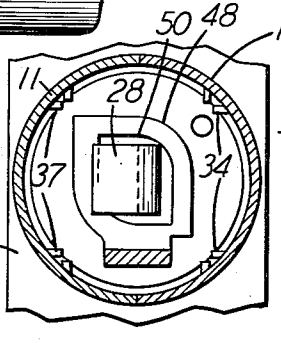


Fig. 6.



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ALTERNATE-HAND DEADLOCKING MECHANISM

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Application March 28, 1955, Serial No. 497,324

4 Claims. (Cl. 292—245)

This invention provides a door lock equipped with the "deadlocking" feature, and capable of being installed with the bolt in either of two positions 180° opposite from each other with respect to the reciprocating mechanism. The "deadlocking" function of the mechanism involves the blocking of the inward movement of the bolt in response to the position of a detector held in the retracted position by the presence of the keeper with which the lock cooperates. Under these circumstances, the bolt cannot be shoved inward with an instrument so as to effect an unauthorized entrance through the door. This general function is not new, and several arrangements have been developed for providing it. The preferred deadlocking mechanism with which this invention is incorporated is illustrated, described, and claimed in the application of Murray E. Williams and Paul H. Grevengoed Serial No. 496,693, filed on March 25, 1955. While the preferred form of this invention is illustrated and described in connection with this particular deadlocking mechanism, the invention is by no means limited thereto.

An important characteristic in most deadlocking mechanisms is the obstruction of the bolt movement through the interposing of a moveable member between the bolt and an abutment which is axially fixed with respect to the housing. This moveable deadlocking member, coupled with the equipment associated with the principal bolt and also the auxiliary bolt or detector, constitutes a considerable accumulation of working parts. The rotation of these components with respect to the housing while maintaining their operating relationship creates a considerable problem of mechanical design. This is the general problem to which this invention has been directed.

A very effective solution to this problem has been provided by utilizing a transverse abutment plate which is rotatably mounted within the housing, with this abutment plate not only serving as the axially fixed member against which the deadlocking mechanism can operate, but also providing a seat for the springs which control the bolt and the auxiliary bolt (or detector). In the preferred form of the invention, the rotatable mounting of the transverse plate is accomplished by providing lanced portions in the housing sections which are axially spaced and disposed in such a manner that the transverse plate may be axially positioned between appropriate sets of these lanced portions. An important advantage of this arrangement is the ease of assembly of the entire mechanism. The bolt, deadlocking mechanism, and bolt stem may (if desired) be collected together in the manner of a sub-assembly with the transverse plate, with this organization then placed in engagement with the housing sections. Since the front plate receives the bolt in non-rotative relationship, it also becomes necessary to mount the front plate with freedom to rotate with respect to the remainder of the housing. This is accomplished by mounting the front plate on a sleeve having flanges parallel to and adjacent the front plate, with the sleeve embracing the two sections of the split housing. The housing and sleeve therefore assume a

journal-and-bearing relationship, with the two alternative bolt positions indicated by the engagement of suitable detent formations on the sleeve with depressions or holes in the housing sections. The selection of the "hand" of the bolt may therefore be accomplished merely by grasping the front plate with one hand and the rearward portion of the housing with the other, and effecting the necessary rotation. As the detent snaps into engagement with its recess, a very noticeable "feel" is created which communicates this fact to the workman making the adjustment.

The several features of this invention will be discussed in detail through an analysis of the particular embodiments illustrated in the accompanying drawing. Referring to the drawing,

Figure 1 presents a sectional elevation of a mechanism embodying this invention, with the bolt in the fully projected position.

Figure 2 presents the same mechanism as illustrated in Figure 1, with the bolt in the fully retracted position generated by the action of the manually-operated reciprocating mechanism.

Figure 3 is a top view of the mechanism as illustrated in Figure 1.

Figure 4 presents a view similar to Figure 3, but with the bolt rotated to a position 180° opposite from that of Figure 3.

Figure 5 is a section taken on the plane 5—5 of Figure 1.

Figure 6 is a view similar to Figure 5, but with the housing rotated 180° with respect to the bolt from the position shown in Figure 5.

Referring to the drawing, a housing for the mechanism may be considered as formed by the opposite housing sections **10** and **11**. A front plate assembly **12** completes the encasement of the mechanism. A sleeve **13** is provided with the flanges **14** and **15** which are fixed with respect to the front plate **16** in the conventional manner. The sleeve **13** embraces the forward portions of the housing sections **13** and **14**, and maintains them in assembled relationship. At the inner extremity of the mechanism, the housing sections **10** and **11** are secured together through the action of the locking plate **17** having the deformable ears **18** and **19** respectively received in suitable apertures in the housing sections **10** and **11**, and deformed after assembly to prevent withdrawal. In addition to the action of the sleeve **13** in maintaining the two housing sections **10** and **11**, together at the forward portion of the mechanism, the sleeve **13** and the housing sections establish a journal-and-bearing relationship whereby the front plate may be rotated with respect to the housing sections **10** and **11**. Preferably, the alternative positions of the bolt at 180 degrees from each other are given positive indication through the engagement of the lanced portions **20** and **21** on the sleeve **13** with apertures as indicated at **22** in Figure 3 in the housing sections **10** and **11**. The resiliency of the sheet metal members permits the sleeve **13** to be forced on to the journal provided by the forward sections of the housing members **10** and **11** in such a relationship that the lanced detent portions **20** and **21** will snap into engagement with the appropriate apertures when the desired position of the bolt is reached.

The illustrated lock is provided with a deadlocking mechanism controlled by the position of the auxiliary bolt, or detector, **23**. This bolt is slideable with respect to the locking bolt **24**, and carries with it a plate **25** in a groove **23***a*, the engagement of the plate **25** within the groove being in the nature of a pressed fit. A deadlocking member **26** is pivotally mounted on the bolt on a pin in the position indicated at **27** in Figure 2. This pin also provides a connection between the bolt and the stem **28**,

the aperture in the stem **28** receiving the pin **27** being elongated in the direction of the axis of movement of the bolt to provide a lost-motion connection. The details of the deadlocking mechanism itself are shown, described, and claimed in the application of Murray E. Williams and Paul H. Grevengoed, filed on March 25, 1955, Serial Number 496,693, and are not themselves a part of this invention.

When the detector bolt **23** and the locking bolt **24** are in the relative positions illustrated in Figures 1 and 2, the operation of the plate **25** will serve to maintain the deadlocking member **26** in the illustrated position. Inward movement of the detector member **23** with respect to the bolt **24** as the door comes into engagement with the keeper eventually creates a condition in which the detector member **23** is maintained inwardly while the bolt assumes a fully projected position. Under this condition, and when the bolt is urged inwardly by an instrument inserted between the door and the jamb, the deadlocking member **26** is swung laterally to the point of bringing the surface **29** into engagement with the side of the central opening in the abutment plate **30** through which the stem **28** and the locking member **26** normally move in sliding relationship. Actuation of the retracting mechanism serves to straighten the locking member again in the position illustrated in Figures 1 and 2 to permit retraction of the bolt, in a manner described in detail in the application referred to above.

The pin **31**, which is fixed with respect to the plate **30** and serves to position the detector spring **32**, also slideably enters into a recess in the detector. The rod **33** is fixed with respect to the locking bolt **24**, and is slideably received within the plate **30**. Rotation of the front plate will cause similar rotation of the bolt, due to the non-rotative engagement between the bolt and the front plate resulting from the non-circular cross section of the bolt. Such rotation is transferred to the abutment plate **30** through the action of the interengaging members operating between the bolt and the plate **30** such as the pin **33**, the pin **31**, and any other similar components. These members provide for the change in relative axial position of the plate and bolt as the bolt slides, but maintain a fixed angular relationship about the bolt axis.

To permit the rotation of the plate **30** with respect to the housing sections **10** and **11**, sets of inwardly-lanced portions are provided as shown at **34** and **35** on the housing section **10** in Figure 3, and **36** and **37** on the section **11**. Sufficient space exists between the lanced portions **34** and **35**, and between the portions **36** and **37** to receive the plate **30** therebetween.

Manual reciprocation of the bolt is obtained through the action of the radius arm unit generally indicated at **38**. A driving slot **39** receives a manually-controlled member, and provides a coupling for the transfer of torque. A reciprocating member, or retractor, **40** is provided with a cam surface **41** at its inner extremity which cooperates with the pin **42** of the radius arm unit. The bolt may be maintained in its fully retracted position through the engagement of the discontinuity **43** with the pin **42**, as shown in Figure 2. This particular portion of the mechanism does not form a part of this invention, and is shown, described, and claimed in the application of Herbert Young and Paul H. Grevengoed, Serial Number 494,662, filed on March 16, 1955. A bearing plate **44** is positioned in the housing sections **10** and **11** through the engagement of suitable projections as indicated at **45** and **46** with appropriately-located openings in the housing sections. The upper portion of the bearing plate **44** is formed in the shape of a fork, and slideably receives the retractor member **40** in bearing engagement primarily with the surface **47**. An L-shaped extension **48** is secured to the forward portion of the retractor **40** through the engagement of the portion **49** with a suitable opening in the member **48**, followed by a sufficient deformity of the member **49** to prevent separation of the components. The

portion of the member **48** which extends generally perpendicularly to the axis of movement of the bolt assembly is formed as best shown in Figures 5 and 6. An opening **50** is provided in this portion of the member **48** which receives the end of the bolt stem **28**, which is laterally bent to prevent axial withdrawal of the stem through the opening **50**. The shape of the opening **50**, however, is such as to permit rotation of the stem with respect to the member **48** while still retaining engagement. The retractor member **40**, and its forward extension **48**, remain rotatably fixed with respect to the housing portions **10** and **11**. Rotation of the front plate, however, carries with it the plate **30** and the bolt stem **28**, which results in relative rotation between the bolt stem **28** and the opening **50**. Figures 5 and 6 differ from each other in the fact that the housing portions **10** and **11** have been rotated 180 degrees while maintaining the front plate and bolt system in the same position.

The particular embodiments of the present invention which have been illustrated and discussed herein are for illustrative purposes only, and are not to be considered as a limitation upon the scope of the appended claims. In these claims, it is our intent to claim the entire invention disclosed herein, except as we are limited by the prior art.

We claim:

1. An alternate-handed latch, comprising: an axially-split housing having opposite sections; a front plate assembly rotatably mounted with respect to said sections, said front plate assembly including a sleeve surrounding the end portions of said housing sections, said front plate assembly also having a bolt-receiving aperture; projection means on said housing sections extending toward the axis of said housing and disposed to provide axially spaced abutments; a plate having a central aperture therein and received between said abutments for rotation with respect to said housing sections; a bolt slideably received in said front plate aperture, and having a stem extending rearwardly and slideably received in said central aperture of said plate; biasing means acting between said plate and said bolt to urge said bolt outwardly; means for maintaining a fixed angular relationship about the axis of said bolt between said bolt and said plate, said means providing for relative axial movement between said bolt and plate; and retracting means including a link rotatably connected to said bolt stem on the inward side of said plate.

2. An alternate-handed latch, comprising: an axially-split housing having opposite sections; a front plate rotatably mounted with respect to said sections, said front plate having an aperture; lanced projection means on said housing sections extending toward the axis of said housing and disposed to provide axially spaced abutments; a plate having a central aperture therein and received between said abutments for rotation with respect to said housing sections; a bolt slideably received in said front plate aperture, and having a stem extending rearwardly and slideably received in said central aperture of said plate; biasing means acting between said plate and said bolt to urge said bolt outwardly; means for maintaining a fixed angular relationship about the axis of said bolt between said bolt and said plate, said means providing for relative axial movement between said bolt and plate; and retracting means including a link rotatably connected to said bolt stem on the inward side of said plate.

3. An alternate-handed latch, comprising: a housing; a front plate rotatably mounted with respect to said housing, said front plate having an aperture; projection means on said housing extending toward the axis of said housing and disposed to provide axially spaced abutments; a plate having a central aperture therein and received between said abutments for rotation with respect to said housing; a bolt slideably received in said front plate aperture, and having a stem extending rearwardly and slideably received in said central aperture of said plate; biasing means acting between said plate and said bolt to

urge said bolt outwardly; means for maintaining a fixed angular relationship about the axis of said bolt between said bolt and said plate, said means providing for relative axial movement between said bolt and plate; and retracting means including a link rotatably connected to said bolt stem on the inward side of said plate.

4. An alternate-handed latch, comprising: a housing; a front plate rotatably mounted with respect to said housing, said front plate having an aperture; projection means on said housing extending toward the axis of said housing and disposed to provide axially spaced abutments; a plate received between said abutments for rotation with respect to said housing; a bolt slideably received in said

front plate aperture, and having a stem extending rearwardly; means for maintaining a fixed angular relationship about the axis of said bolt between said bolt and said plate, said means providing for relative axial movement between said bolt and plate; and retracting means including a link rotatably connected to said bolt stem.

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